

## New locality records of freshwater decapods from México (Crustacea: Atyidae, Cambaridae, and Palaemonidae)

Gabino A. Rodríguez-Almaraz and Ernesto Campos

(GAR-A) Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, A.P. 105-F,  
Ciudad Universitaria, San Nicolás de los Garza, Nuevo León, México;

(EC) Facultad de Ciencias, Universidad Autónoma de Baja California, A.P. 2300,  
Ensenada, Baja California 22800, México

*Abstract.*—Collections in the Mexican states of Nayarit, Nuevo León, Tamaulipas, San Luis Potosí and Veracruz, provided significant new distribution records or data for seven freshwater decapods species. Information on each species is presented, including restricted synonymy, previously known distribution, new localities, and notes on the significance of the new data.

Villalobos-Hiriart et al. (1993) reported that Mexican freshwater decapods comprised about 132 species. Of these, many are known only from the type locality and, in several cases, knowledge on habitat is scarce or non-existent. Rapid changes in habitat conditions, introduction of non-native species, and decline in abundance of some elements of the original crustacean decapod fauna in northern México (see Contreras-Balderas 1991; Rodríguez-Almaraz & Campos 1994) prompted us to update the diversity, ranges, and habitat of the 22 species reported from that region. Collections in selected freshwater habitats in the states of Nayarit, Nuevo León, Tamaulipas, San Luis Potosí, and Veracruz produced significant new distribution data for seven freshwater decapods species one Atyidae, one Cambaridae and five Palaemonidae). Abbreviations used are: UANL, Arthropoda Collection, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León; UABC, Invertebrate Collection, Facultad de Ciencias, Universidad Autónoma de Baja California; IBUNAM-EM, Crustacean Collection, Instituto de Biología, Universidad Nacional Autónoma de México. For each species listed, a restricted synonymy is provided and includes original

description or redescription, changes in generic assignment, and known distribution.

### Family Atyidae

*Potimirim mexicana* (De Saussure, 1857)

*Potimirim mexicana.*—Villalobos-Figueroa, 1959:295–313, pl. VI, figs. 29–38, pl. VII, figs. 39–50, pl. VIII, figs. 51–54, pl. IX, figs. 55, 56, map. 2, 3.—1982:217, 223.—Hart, 1961:67, 76.—Smalley, 1963:177, 179, 181.—Villalobos-Hiriart et al., 1993:281.

*Known distribution.*—México. This species is found near the sea in the hydrological system of the Gulf of México slope, from Río Soto la Marina basin, Tamaulipas, to Río Grijalva basin, Tabasco, and rivers emptying in Laguna del Carmen, Campeche. Central America. Honduras, Costa Rica. Antilles. Cuba, Jamaica and Puerto Rico (Villalobos-Figueroa 1982).

*Material examined.*—21 females, Estero de Canalá, Guayabitos, Nayarit, 21°05'N, 105°15'W, 1 Jun 1995 (UANL). 8 males, 13 females, Camino a las Varas, Nayarit, 21°10'N, 105°14'W, 2 Jun 1995. 4 males, Río Coy (Río Choy) [Río Pánuco basin], 28 km south of Valles city, San Luis Potosí, 21°51'N, 98°56'W, 27 Aug 1994 (UANL). 3 males (topotypes, IBUNAM-EM uncat.),

M. A. Quevedo Park, Playa Norte, Veracruz, Veracruz, 19°14'N, 96°08'W, 1958.

*Remarks.*—Our specimens agree with Villalobos-Figueroa's (1959) description except that we found up to 15 uncinuli on the appendix interna and, like in *P. potimirim* (Müller), a plumose seta close to it. Even so, morphometric and shape features recorded by Villalobos-Figueroa allow easy separation of these two species. This record represents the farthest inland finding of *P. mexicana* in the Gulf of México slope, approximately 250 km upstream in the Rio Panuco-Rio Coy basin, and is the first report of this species in the Mexican Pacific slope.

#### Family Cambaridae

##### *Procambarus roberti*

Villalobos-Figueroa & Hobbs, 1974

*Procambarus (Pennides) roberti* Villalobos-Figueroa & Hobbs, 1974:8, fig. 2.—Hobbs, 1989:74.

*Known distribution and habitat.*—Ditch from La Media Luna, 4.8 miles (7.7 km) south of Río Verde (on highway to Pedro Montoya) and 2.5 miles (4 km) west on dirt road to Mina El Refugio, San Luis Potosí (type locality). In streams.

*Material examined.*—1 male I, 3 females, 6 juvenile males, 7 juvenile females, El Venado, San Luis Potosí (151 northwest of San Luis Potosí city and 105 km southwest of Matehuala city, San Luis Potosí), 22°58'N, 101°04'W, Feb 1994 (UANL).

*Remarks.*—The habitat of *Procambarus roberti* at El Venado is a spring-pool of approximately 20 m<sup>2</sup> with clear water and a rocky bottom. Only scarce grasses were observed in the margin of the pool amongst which the crayfishes were collected. Ostracods of the genus *Darwinula* and *Cyprionodopsis* were in the sediment of the bottle where the crayfishes were fixed; however, the entocytherid symbiont, *Ankylocythere barbouri* Villalobos-Figueroa & Hobbs, 1974, was not found. It is not clear how *P. roberti* moved 160 km northwest from La

Media Luna to El Venado since no superficial aquatic drainage system connects these localities. An hypogean dispersion or human introduction are two possible explanations.

#### Family Palaemonidae

##### *Macrobrachium acanthurus*

(Wiegmann, 1836)

*Palaemon acanthurus* Wiegmann, 1836: 150.

*Macrobrachium acanthurus*, Hedgpeth, 1949:30, figs. 1a, 2, 5.—Holthuis, 1952: 45–53, pl. 8, 9, figs. a, b.—Villalobos-Figueroa, 1982:217, 224.—Williams, 1984:66–68, figs. 44, 45.—Markham et al., 1990:419.

*Known distribution and habitat.*—From North Carolina, U.S.A. to Brazil (Holthuis 1952; Williams 1984). In México it ranges from southern Tamaulipas to Quintana Roo (Markham et al. 1990). The species lives in fresh or sometimes brackish water, and generally is not found far inland (Holthuis 1952).

*Material examined.*—3 males, Río Ramos [San Juan basin], municipality of Allende, Nuevo León, 25°16'N, 100°00'W, 15 Apr 1992 (UANL).

*Remarks.*—This is the first record of *M. acanthurus* in the state of Nuevo León and represents the farthest inland finding of this species in México, approximately 360 km upstream in the Río Bravo-Río San Juan basin.

##### *Macrobrachium hobbsi*

Nates-Rodriguez & Villalobos-Hiriart, 1990

*Macrobrachium hobbsi* Nates-Rodriguez & Villalobos-Hiriart, 1990:7, Fig. 3.—Villalobos-Hiriart et al., 1993:285.

*Known distribution.*—Los Tuxtlas area, southern Veracruz; Arriaga and Tonalá, Chiapas; Río Ostuta, Oaxaca, and Río Murga near Petatlán, Guerrero; presumably to

Nayarit (Nates-Rodríguez & Villalobos-Hiriart 1990; Villalobos-Hiriart 1993).

*Material examined*.—4 males, 1 female, 20 juveniles, Río Coy (=Río Choy), 28 km south of Ciudad Valles, San Luis Potosí, Apr, Jun 1994 (UANL); 1 male, 1 female, Río Huichihuayán, 70 km south of Ciudad Valles, San Luis Potosí, 21°32'N, 98°56'W, Apr 1994 (UANL); 7 juveniles, small pool, km 160 on the highway Tuxpam-Tampico, (30 km south of Pánuco [Ozuluama]), Veracruz, 21°51'N, 97°48'W, Nov 1993 (UANL); 3 juveniles, small pool, km 240 on highway Poza Rica-Tuxpam, Veracruz, 20°45'N, 97°31'W, Nov 1993 (UANL).

*Remarks*.—The presence of *M. hobbsi* in northern Veracruz and San Luis Potosí represents a northern range extension of approximately 850 km. It is remarkable that juveniles of *M. hobbsi* were found in the same habitat with *Palaemonetes mexicanus* Strenth, at Río Coy, San Luis Potosí. This does not agree with Strenth's (1976) conclusion that juveniles of *Macrobrachium* competitively exclude *Palaemonetes*.

*Macrobrachium olfersi*  
(Wiegmann, 1836)

*Palaemon olfersii* Wiegmann, 1836:150.

*Macrobrachium olfersi*.—Holthuis, 1952: 95–103, pl. 24, pl. 25, figs. a, b.—Hedgpeth, 1949:35, figs. 1d, 4, 5.—Villalobos-Figueroa, 1967:167–171.—Villalobos-Hiriart, 1993:285.

*Known distribution*.—Western Atlantic slope. Lower Cape Fear River near Southport, North Carolina; Florida; Louisiana; Texas; and southern Veracruz, México to Santa Catarina, Brazil (Holthuis 1952). Eastern Pacific slope. From Chiapas to Nayarit, México (Villalobos-Hiriart et al. 1993).

*Material examined*.—1 male, 3 juveniles, Río Limón, 8 km north of Ciudad Mante, Tamaulipas, 22°49'N, 98°56'W, 12 Jun 1994 (UANL).

*Remarks*.—The identification of *M. olfersi* was possible by comparing the adult

male above noted with the description and figures provided by Holthuis (1952). The shrimps were collected in a shallow water area (15 cm depth) of the Río Limón, amongst aquatic vegetation. This records represent the farthest inland finding of this species in México, approximately 205 km upstream in the Río Guayalejo-Río Limón basin.

*Palaemonetes kadiakensis* Rathbun, 1902

*Palaemonetes kadiakensis* Rathbun, 1902: 93.—Strenth, 1976:2.—1994:91.

*Palaemonetes (Palaemonetes) kadiakensis*, Holthuis, 1949:92.—1952:212, pl. 51, figs. k–n, pl. 52, figs. a, b.—Smalley, 1964: 231.—Flemming, 1969:444.—Villalobos-Figueroa & Hobbs, 1974:15, fig. 8b.

*Known distribution*.—This species is widespread in fresh-water habitats of Central U.S.A., including the shores of lakes Ontario, Erie, and Michigan, the Mississippi basin, and the basin of several rivers emptying east and west of the Mississippi river in the Gulf of México (Holthuis 1952). The only Mexican record is that of Creaser (1932) for the state of Nuevo León, northeast México (Strenth 1976).

*Material examined*.—4 males, 5 females (1 ovigerous), Río Sabinas Hidalgo, Vallecillos, Nuevo León, 26°39'N, 99°59'W, 20 Apr 1979 (UANL). Tamaulipas: 21 males, 15 females, 13 Mar 1981 (UABC); 1 male, 3 ovigerous females, 22 Oct 1981; 1 male, 4 ovigerous females, 22 Nov 1981; 1 male, 6 females, 30 Jun 1982, Río Alamo, Cd. Mier, 26°25'34"N, 99°06'41"W; 1 male, 4 females (2 ovigerous), 23 Oct 1983, Presa Falcón, Miguel Alemán, 26°39'N, 99°12'W; 1 male, 2 females, 30 Mar 1983; 1 male, 4 females, 14 Mar 1987; Río Bravo, Matamoros 25°50'N, 97°24'W (UANL).

*Remarks*.—Based on the present record we believe that the material reported by Creaser (1932) from Nuevo León came from the Río Alamo-Río Salado basin (northern Nuevo León), which empties into the Río Bravo del Norte (Rio Grande) in

the state of Tamaulipas. Previous collecting efforts in Central Nuevo León (Río San Juan basin) failed to produce specimens of *P. kadiakensis*.

The material of the Río Alamo (13 Mar 1981) was collected in shallow (<1 m depth) and clear-greenish water, the bottom was muddy and the aquatic vegetation included *Chara* sp. Additional information on the habitat is noted in Ruíz-Campos et al. (1985).

*Palaemonetes mexicanus* Strenth, 1976

*Palaemonetes mexicanus* Strenth, 1976:7, fig. 3.—1994:291.

*Known distribution and habitat*.—Small spring-fed river, 15 miles (24 km) west of Ciudad Valles, San Luis Potosí (type locality).

*Material examined*.—7 males, 20 females (5 ovigerous), Río Coy, 28 km south of Ciudad Valles, San Luis-Potosí, Apr, Jun 1994 (UANL).

*Remarks*.—This is apparently the first record of *P. mexicanus* since its original description by Strenth (1976). The new locality is about 50 km southeast of the type locality. Hobbs & Hobbs (1989) reported *P. mexicanus* to Mante river (Ciudad Mante, Tamaulipas); however, Strenth (1994) pointed out that Hobbs & Hobbs' specimens are of *P. hobbsi* Strenth, 1994.

Five ovigerous females (cl. 11.4–18.5 mm) were carrying 13 to 31 eggs having a diameter of 0.89–1.12 mm ( $\bar{X}$  = 0.99) by 1.15–1.4 mm ( $\bar{X}$  = 1.25).

#### Acknowledgments

Financial support for a short-term visit to the Crustacean Collection, Instituto de Biología, Universidad Nacional Autónoma de México (UNAM) was provided by Dirección de Intercambio Académico, UNAM to GAR-A. Our great appreciation is given to J. F. Fitzpatrick Jr., H. H. Hobbs III, N. E. Strenth and J. L. Villalobos-Hiriart for their criticism and helpful comments on the

manuscript. EC is a fellow of the "Programa de Estímulo al personal Académico 94/95" of the Universidad Autónoma de Baja California (UABC). This is contribution number 4 of the program "Crustáceos Decápodos (formerly Cambarinos) del Norte de México" of the UABC and Universidad Autónoma de Nuevo León.

#### Literature Cited

- Contreras-Balderas, S. 1991. Conservation of Mexican freshwater fishes: some protected sites and species and recent federal legislation. Pp. 191–197 in W. L. Minckley and J. E. Deacon, eds., *Battle against extinction: native fish management in the American West*. University of Arizona Press, Tucson, Arizona.
- De Saussure, H. 1857. Diagnoses de quelques Crustacés nouveaux de l'Amérique tropical.—*Revue et Magasin de Zoologie pure et appliquée* 2(9):501–505.
- Creaser, E. P. 1932. The decapod crustaceans of Wisconsin.—*Transactions of the Wisconsin Academy of Sciences, Arts and Letters* 27:321–338.
- Flemming, L. E. 1969. Use of male external genitalic details as taxonomic characters in some species of *Palaemonetes* (Decapoda, Palaemonidae).—*Proceedings of the Biological Society of Washington* 82:443–452.
- Hart, C. W. 1961. The freshwater shrimps (Atyidae and Palaemonidae) of Jamaica, W.I. with a discussion of their relation to the ancient geography of the Western Caribbean area.—*Proceedings of the Academy of Natural Sciences of Philadelphia* 113(4):61–80.
- Hedgpeth, J. W. 1949. The North American species of *Machrobrachium* (River shrimps).—*Texas Journal of Science* 1:28–38.
- Hobbs, H. H. Jr. 1989. An illustrated checklist of the American crayfishes (Decapoda: Astacidae, Cambaridae, and Parastacidae).—*Smithsonian Contribution to Zoology* 480:1–235.
- , & H. H. Hobbs III. 1989. New locality records for two poorly known Mexican freshwater shrimps (Decapoda, Palaemonidae).—*Crustaceana* 57(2):220–222.
- Holthuis, L. B. 1949. Note on the *Palaemonetes* (Crustacea Decapoda) found in the United States of America.—*Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen* 52:87–95.
- . 1952. The subfamily Palaemoninae. A general revision of the Palaemonidae (Crustacea Decapoda Natantia) of the America, II.—*Allan Hancock Foundation Occasional Papers* 12:1–396.

- Markham, J. C., F. E. Donath-Hernandez, J. L. Villalobos-Hiriart, & A. Cantú Díaz-Barriga. 1990. Notes on the shallow-water marine crustacea of the Caribbean coast of Quintana Roo, México.—*Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoológica* 61(3):405–446.
- Nates-Rodríguez, J. C., & J. L. Villalobos-Hiriart. 1990. Dos nuevas especies de camarones de agua dulce del género *Macrobrachium* Bate, (Crustacea, Decapoda, Palaemonidae), de la vertiente occidental del Pacífico.—*Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoológica*, 61(1):1–11.
- Rathbun, M. J. 1902. Description of new Decapod Crustaceans from the West coast of North America.—*Proceeding of the United States National Museum* 24:885–905.
- Rodríguez-Almaraz G. A., & E. Campos. 1994. Distribution and status of the crayfishes (Cambaridae) of Nuevo León, México.—*Journal of Crustacean Biology* 14(4):729–735.
- Ruíz-Campos, G., M. Torres-Morales and S. Contreras-Balderas. 1985. Peces del Río Alamo, Subcuenca del Bravo, México. II. Estructura y dinámica de la comunidad íctica.—*Instituto de Investigaciones Científicas, Universidad Autónoma de Nuevo León (México)* 2:51–75.
- Smalley, A. E. 1963. The genus *Potimirim* in Central America (Crustacea, Atyidae).—*Revista de Biología Tropical* 11(2):177–183.
- . 1964. A new *Palaemonetes* from México (Decapoda: Palaemonidae).—*Crustaceana* 6: 229–232.
- Strenth, N. E. 1976. A review of the systematics and zoogeography of the freshwater species of *Palaemonetes* Heller of North America (Crustacea: Decapoda).—*Smithsonian Contribution to Zoology* 228:1–28.
- . 1994. A new species of *Palaemonetes* (Crustacea: Decapoda: Palaemonidae) from north-eastern México.—*Proceedings of the Biological Society of Washington* 107:291–295.
- Villalobos-Figueroa, A. 1959. Contribución al conocimiento de los Atyidae de México. II. (Crustacea, Decapoda). Estudio de algunas especies del género *Potimirim* (*Ortmannia*), con descripción de una especie nueva en Brasil.—*Anales del Instituto de Biología, Universidad Nacional Autónoma de México* 30:269–330.
- . 1967. Estudio de los Palaemónidos de México I. *Macrobrachium acanthochirus* una nueva especie del SE de México.—*Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoológica*, 26(1/2):167–174.
- . 1982. Decapoda. Pp. 215–239 in S. H. Hurlbert and A. Villalobos-Figueroa, eds., *Aquatic biota of México, Central America and the West Indies. Aquatic Biota-San Diego State University Foundation, San Diego California*.
- , & H. H. Hobbs, Jr. 1974. Three new crustaceans from La Media Luna, San Luis Potosí, México.—*Smithsonian Contribution to Zoology* 174:1–18.
- Villalobos-Hiriart, J. L., A. Cantú Díaz-Barriga, & E. Lira-Fernandez. 1993. Los Crustáceos de Agua Dulce de México.—*Revista de la Sociedad Mexicana de Historia Natural* 44:267–290.
- Wiegmann, A. F. A. 1836. Beschreibung einiger neuen Crustaceen des Berliner Museums aus Mexiko und Brasilien.—*Archiv für Naturgeschichte* 2(1):145–151.
- Williams, A. B. 1984. Shrimps, lobsters and crabs of the Atlantic coast of the eastern United States, Maine to Florida. *Smithsonian Institution Press, Washington D.C.*, 550 pp.